

$$\log_e(x) = \ln x$$

$$e = 2.72$$

$$\log_a a = 1$$

$$\log_e e = 1 = \ln e$$

$$\log_{10} 10 = 1$$

$$\log_{10}(x) = \log x$$

$$\log_e x = 2.303 \log_{10} x$$

or

$$\ln x = 2.303 \log x$$

$$\log 2 = 0.3$$

$$\log 3 = 0.47$$

$$\log 8 = \log 2^3 = 3 \log 2 = 3 \times 0.3 = 0.9$$

$$\log 12 = \log(4 \times 3) = \log(2^2 \times 3) = \log 2^2 + \log 3$$

$$\begin{aligned} &= 2 \log 2 + \log 3 \\ &= (2 \times 0.3) + 0.47 \\ &= 0.6 + 0.47 \\ &= 1.07 \end{aligned}$$

$$\log 2 = 0.3$$

$$\ln 2 = 2.303 \log 2 = 2.303 \times 0.3$$

$$\log 3 = 0.47$$

$$\log 5 = 0.7$$

$$\log 7 = 0.84$$

$$\log 11 = 1.043$$

xx

$$\log(a^m) = m \log a$$

xx

$$\log(a \times b) = \log a + \log b$$

$$\log(x)$$

$$1 \leq x \leq 10$$

$$0 \leq \log x \leq 1$$

$$\log\left(\frac{a}{b}\right) = \log a - \log b$$

$$\frac{\log a}{\log b} \neq \log a - \log b$$

$$\log\left(\frac{7}{3}\right) = \log 7 - \log 3 = 0.84 - 0.47$$

$$\log(1.5) = \log\left(\frac{3}{2}\right) = \log 3 - \log 2$$

$\log 0 \rightarrow$ undefined

$\log(-x) = X$

$$\log y = 3.4$$

$$\log_{10} x = 5 \quad x = 10^5$$

$$y = 10^{3.4}$$

or

$$y = \underline{\underline{2.5 \times 10^3}}$$